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Statement of

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Administrator

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

before the

Committee on Science and Astronautics  
House of Representatives

Mr. Chairman and Members of the Committee:

It is an honor to be here today in my first appearance before the full Committee to present NASA's FY 1973 Authorization request. I am very much aware of how important the strong support and wise counsel of this Committee has been over the years to NASA and the nation's aeronautical and space programs. I look forward to working with you all as we move forward in aeronautics and space in the years ahead.

The Fiscal Year 1973 budget for NASA will indeed enable the United States' aeronautics and space program to move forward, and to do so on a basis consistent with realistic budgetary constraints both now and in the future.

It moves forward in that it fully supports President Nixon's decision to proceed with the development of the space shuttle, the keystone to the nation's future in space; it

continues our major on-going space programs; and it provides a 50% step-up in our work in aeronautics.

It is realistic in that it supports these objectives within a FY 1973 budget approximately equal to that of last year, and under a plan that does not commit the nation to higher total NASA budget levels in future years.

I will review briefly the most significant elements of our FY 1973 budget proposals and then touch briefly on some other matters of interest or concern to NASA and the Committee at this time.

First, the space shuttle. As reported to the Committee in detail in my letter to the Chairman of January 14, 1972, we have made a definite decision on the configuration concept. The development cost of \$5.5 billion will be about one-half of what the initial concept under study a year ago would have cost. This spring we will make final decisions on the booster and some open technical details and issue a request for proposals to contractors. We will then be able to reach a decision on the launch and landing site. The FY 1973 budget, if approved by Congress, will provide the funds required in FY 1973 to proceed with development and provide needed development facilities.

I am sure that this Committee is fully aware of the reasons for the central importance we attach to the space shuttle for the future of the United States space program.

In brief:

- The shuttle will provide the means for routine, quick reaction, and economical access to and return from space needed for scientific, applications, and military uses of space in the 1980's and beyond.
- The shuttle will reduce the cost of space operations substantially. With space budgets at about current levels, the total savings to NASA, DOD, and other users are estimated to average a billion a year in the 1980's.
- Finally, the shuttle will assure that the United States will have a continuing effective presence in space. Without it there would be no U.S. manned space flights after the Apollo and Skylab missions are completed.

Mr. Chairman, to conserve time I will not dwell longer on the shuttle. Instead, with your permission, I would like to place two items in the record:

- The Space Shuttle Fact Sheet, attached to my statement, which summarizes what the space shuttle is, what it will do, what it will cost, and what it will save, and
- My letter to you of January 14, 1972, which describes in considerable detail how we arrived at the shuttle configuration concept decision and how we are now proceeding with the final steps necessary before initiating development.

I should emphasize that the steps we have taken and are taking are fully in accord with the plan and approach for the space shuttle presented to and approved by Congress in our FY 1972 authorization and appropriations, namely, to proceed in FY 1972 with engine development and to continue studies or initiate development of the shuttle itself, depending on the progress in the studies. We will, of course, continue to keep the Committee currently informed of significant developments and decision points as they occur.

The second very significant feature of NASA's FY 1973 budget is that it supports the continuation of the major space flight projects NASA now has underway. We have only one new space project in FY 1973, the important TIROS N weather satellite.

Our total FY 1973 budget is constrained to approximately the FY 1972 level. But the programs authorized in previous years are coming to fruition and the nation will begin to realize the scientific and practical benefits of the efforts we have had underway for many years.

- Apollo 16, now scheduled for launch April 16, and Apollo 17, this December, will make the last Apollo scientific expeditions to the moon. In terms of scientific information, Apollo 16 and 17 should surpass even the spectacular results of Apollo 15 which are adding entirely new dimensions to our understanding of the moon and its significance for a better understanding of the earth.
- Skylab, our experimental space station, now in the crucial qualification phase of development, will be placed in orbit in 1973 for our astronauts to conduct the wide range of planned experiments in solar astronomy, earth resources, medical, and other fields.
- Mariner 9 is now daily sending back exciting new information on the planet Mars. In a real sense we are discovering, with this information, a new planet, much different from what was known or expected from

ground observations and the relatively brief glimpses from Mariners 4, 6, and 7. Viking is on schedule to make our first landings on Mars in 1976 with scientific instruments that should make another giant leap in our understanding of this planet and its similarities and differences from the earth. The most recent information from Mariner 9 has greatly increased the possibility that some form of life may be found on Mars.

-- Pioneer F, man's first mission to Jupiter and the farthest penetration into space so far, is scheduled for launch at the end of this month. This will also be the highest velocity space launch to date: the high speed required to reach Jupiter will get Pioneer F out as far as the moon in only eleven hours! It will travel 900,000,000 kilometers (600,000,000 miles) to Jupiter in a little less than two years.

-- Going in the other direction, a Mariner spacecraft will swing by Venus to Mercury in 1973, and in 1974 and 1975 Helios, our cooperative project with the West Germans, will fly three quarters of the way to

the sun to make the closest solar observations ever made.

-- Orbiting observatories will continue to push back the frontiers of the cosmos with their observations of features of the universe that are invisible from the surface of the earth. OAO-2, launched more than three years ago, is still hard at work. OAO-C, with a different and more complex set of ultraviolet measuring instruments, will be launched this summer. Development of the new High Energy Astronomical Observatory (HEAO) to look systematically at the mysterious X-and gamma ray sources deep in the universe will proceed, aimed at launches in 1975 and 1977. We will also proceed as planned with OSO I, the advanced satellite to observe the sun, but have deferred, at least for now, work on further satellites in this series.

-- Last--in order in my statement but perhaps first in importance--are our applications satellites:

- The launch, early this summer, of ERTS-A, the first experimental earth resources survey satellite, will be a major milestone in the development

of practical uses of space. The more than 300 experiments with ERTS data planned by over a dozen agencies will represent the most massive effort to date to explore experimentally the direct uses and benefits of space for men on earth.

- The practical uses of weather satellites will continue to be pushed with the launch of the first SMS stationary weather satellite, further sensor experimentation with Nimbus satellites, and initiation of development of TIROS N to incorporate the advances of recent years into the nation's operational weather satellite system.
- In the communications field, advanced technology and user experiments will be conducted with ATS F, scheduled for launch in 1973, and ATS G, now scheduled for launch in 1975.

A third extremely significant feature of NASA's FY 1973 budget is the very substantial increase in aeronautics. The joint Department of Transportation-NASA Civil Aviation Research and Development ("CARD") Study completed last year



showed clearly what the needs are. The FY 1973 budget supports NASA efforts to meet them.

For example, we will intensify our efforts on the QUESTOL program--the name we now give the program for the development of an experimental quiet short take-off and landing research aircraft we are starting in FY 1972. We will also begin work on an engine modification kit--using new technology developed by NASA, DOT, and industry--which can permit airlines to reduce the objectionable noise of older jet engines. These are but two elements of the clearly laid out program we have developed to attack the top priority problems facing the nation in civil and military aeronautics. I believe that this program is responsive to the strong urgings of this Committee that more and better focussed attention be given to aeronautics.

Let me now turn to the financial implications of our FY 1973 budget. The NASA FY 1973 authorization and appropriation request is \$3.379 billion. This budget was prepared under tight constraints. The total has been held to approximately the same level as in FY 1971 and FY 1972. But we have applied yet another constraint of fundamental importance.

In developing the FY 1973 budget, we have reconfigured NASA's programs and long-range plans in such a way that they

will not commit the nation to large increases in the NASA budget in future years. The projected total annual "run-out" costs for continuing or completing the programs in our FY 1973 budget do not rise above the level of the FY 1973 budget. In contrast, the corresponding "run-out" projections submitted last year rose to \$4 billion. Attached to my statement is a chart which graphically illustrates this difference in our planning, this year compared to last year.

Under our present plan, by properly time-phasing the start of future new programs, we can maintain a viable, useful, and balanced NASA program in space and aeronautics at a total annual budget level which, in 1971 dollars, can remain approximately at the FY 1973 appropriation level for the indefinite future--unless, of course, the President and Congress decide the program should be expanded or accelerated.

Mr. Chairman, I strongly believe that this posture of a realistic long-term plan in which the nation's commitment is limited to budgets of approximately the current size is the proper posture for NASA from the standpoint of responsible management and is also essential at this time to assure continued broad-based support for the NASA program.

To achieve this posture, we have had to make some basic changes in our planning and accept yet another stretch-out of

the period over which our continuing and long-term objectives in space exploration and space science will be achieved:

- As I have mentioned, we selected a space shuttle concept with development costs about half of what the configuration envisaged last year would have cost, and whose peak annual funding requirements can fit within a balanced total NASA program at current total budget levels.
- We have reduced and redirected our program for exploration of the outer planets. The previously planned Grand Tour missions to the outer planets in the late 1970's would have been costly and would have required heavy funding in the next few years to meet the unique launch opportunities. Partly for these reasons, the Grand Tour received less than wholehearted support from some of the scientific community. We have, therefore, replaced the Grand Tour missions with less complex missions in the same time period to Jupiter and perhaps Saturn.
- Finally, as reported in my letter of January 24, 1972, we have decided to terminate the NERVA program for developing a 75,000-lb. thrust nuclear rocket engine.

Under last year's budget we have been in a holding position in this program to see whether development of this engine should be resumed. The stretch-out in our future plans necessary to avoid large budget increases in future years served to push even farther into the future the earliest times we could hope to mount missions that would use the NERVA engine. This fact, together with the need to hold down expenditures in the 1970's, led us reluctantly to the conclusion that reinstatement of NERVA development could not be justified and that the existing development contracts should be terminated.

At the same time, cancellation of the Grand Tour missions has introduced the new class of future missions for which a much smaller nuclear rocket engine appears to be particularly well suited: the first missions to the distant planets--Uranus, Neptune, and Pluto. Now that we will miss the opportunity for gravity assisted Grand Tour missions, we will need a new high energy propulsion system to reach these planets. A nuclear rocket engine in the 15,000-20,000 pound thrust class may well be the

answer. In the FY 1973 budget, therefore, NASA and AEC will proceed with definition of such an engine and the trade-off studies necessary to establish the preferred propulsion system for missions to these distant planets in the 1980's.

Now I would like to mention a number of matters that will be of interest to the Committee.

For NASA civil service personnel, the budget shows a reduction of 650 positions in FY 1973 in addition to the FY 1972 reduction of 850 made last year after our FY 1972 budget had been approved by the Congress. These reductions, in effect, represent the application to NASA of the 5% across-the-board reduction in personnel ordered by the President last August. We had hoped to accomplish these reductions by attrition, but it now seems likely that some reduction-in-force actions will be necessary.

These most recent reductions, totalling 1,500, come on the heels of the 1,500 reduction previously planned in our FY 1972 budget and yet another 1,500 reduction the year before. With our overall budget level and program now stabilized, I believe that our civil service employment should likewise be stabilized at the 26,850 position level we will reach at the

end of FY 1973. Mr. McCurdy will discuss with the Committee the results of his study of NASA's institutional base and personnel requirements later in these hearings. The proper and efficient management of NASA as an institution is one of our most important continuing concerns.

Another matter of concern is the reliability of our two principal unmanned launch vehicles, the Delta and the Centaur. We are following up our reviews of recent failures with an intensive corrective program. The adjustments necessary in our FY 1972 budget for this purpose will be the subject of an official reprogramming that will be sent to the Congress in the near future.

In the area of facilities, I have approved the recent report of the Facilities Management Review Committee, appointed by Dr. Low last year, which was made available to the Committee a short time ago. The authorization bill before you reflects its recommendations. I believe that by implementing this report, we can achieve substantial improvements in this area. I wish to express NASA's appreciation for the cooperation of the Committee and its staff in developing improved methods for handling facilities matters.

Now I would like to comment briefly on the status of our negotiations on space cooperation with the Soviet Union. As the Committee has been advised, we have made what appears to be good progress in several areas. We have set up three joint working groups in the fields of near-earth space, the moon, and the planets; satellite and rocket meteorology; and study of the natural environment. In the planetary field, we have arranged for direct teletype communications to exchange findings of special interest by the Soviet Mars 2 and 3 and the U.S. Mariner 9 missions. Lastly, we have had a series of detailed technical discussions on the design of compatible systems which would permit future U.S. and Soviet manned spacecraft to rendezvous and dock with each other for rescue or other purposes. There have been technical discussions of the possibility of an early experimental mission in which an Apollo spacecraft would rendezvous and dock with a Soviet Salyut-type space station. No decision has been made on conducting such a mission but we are taking the steps necessary to preserve the option for using surplus Apollo and Saturn IB hardware for this purpose.

Mr. Chairman, the Committee will note that the format of our budget justifications book has been changed somewhat in

an effort to present more clearly the need for and planned use of the funds requested. You will also be interested, I believe, to see that for the first time we have endeavored to present our technical justifications in metric units throughout, with conventional units indicated in parentheses where needed for clarity. This is the latest in the steps NASA has been taking in the converting to the use of metric units in our publications, our thinking, and to the degree practical in our engineering and fabrication activities. This will take time, we realize, and there will have to be exceptions for some time to come. (I note that I referred a moment ago to the 75,000 pounds, not the 330,000 Newtons of thrust of the NERVA engine.) But we share the Committee's interest in moving steadily toward wider use of the metric system.

In conclusion, Mr. Chairman, I would like to say a very few words on the importance of the space program. Scientific knowledge, scientific exploration, and the practical applications of aeronautics and space are enormously important in their own right. But perhaps most important of all is the need for the United States to have a continuously advancing technology.



To meet the pressing social problems of our times requires above all a sound economy operating at a high level of employment to generate the tax revenues required at all levels of Government. To maintain such an economy in a competitive world, we must increase our productivity year after year, decade after decade. The only way in the long-term to keep increasing our productivity is through advancing our technology.

I know of no other activity which has done and can do as much to keep the U.S. strong in advanced technology as NASA's programs in space and aeronautics. Maintenance of technological leadership is a long-term matter. It takes many years for new technology to have its effects on the economy. But the problem is before us now. In 1971, the United States for the first time had an annual trade deficit, a net total deficit of over \$2 billion. But this deficit would have been three times that amount had it not been for the favorable balance of trade of almost \$4 billion the United States achieved in the aerospace field.

The economic necessity for advanced technology; the direct practical benefits of space applications and improved aircraft, including their significance for national defense; and the

human and future practical values of increased understanding of the earth, sun, moon, planets, and universe--these are the basic reasons for maintaining a strong national program in space and aeronautics. They are also the basic reasons why, in my opinion, Mr. Chairman, the Congress and the nation should support the forward moving and realistic program the President has recommended for NASA in his FY 1973 budget.

Mr. Chairman, this concludes my statement.

## COMPARISON OF RUNOUT COSTS (WITHOUT FUTURE NEW STARTS)

